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Foreign AGRICULTURE

REVIEW OF FOREIGN FARM POLICY, PRODUCTION, AND TRADE

IN THIS ISSUE

ANGOLA (PORTUGUESE WEST AFRICA)
NORWAY'S PRE-WAR FISH BALANCE

FILE COPY

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By Sylvia S. Goodstein*

Public attention has been sharply focused on the African scene in recent months, both politically and with respect to the agricultural products that might be made available to the United Nations. Angola's land boundaries touch at all points territories controlled by the Allies. Before the war, corn, coffee, sugar, and coconuts were the chief agricultural exports from Angola, and imports included such foodstuffs as wheat flour, butter and butter substitutes, rice, and olive oil.

Angola is a country of considerable agricultural potentialities. In comparison with other African countries, it ranks third in land capable of production. According to some authorities, of a total acreage of 312,200,000 acres about 90 percent is suitable for crop production. Only about 2,200,000 acres or less than 1 percent is under cultivation; 95 percent represents native agriculture and 5 percent European concessions. Conditions of soil and climate favor cultivation of such products as coffee, sisal, sugar, rice, corn, beans, palm oil, other oilseeds, vegetables, and fruits.

Oldest among the West African colonies, Angola's ties with Portugal date back to the year 1486. Even as late as 1870, however, Portugal's interests were confined to a few trading posts on the coast. Not until the last quarter of the nineteenth century did Portugal begin to effect an actual occupation of the country. It was hoped that the revival of Portuguese colonial enterprise would bring about a greater development of the colony. But progress was hampered by a lack of sufficient capital.

The majority of natives grow enough food for their own needs. However, increased production has been retarded because of low prices paid to natives, an insufficient number of trading centers in the interior, a shortage of light hand-powered machinery and plows, and a shortage of trained agricultural personnel among the Africans. The Angolan Government has tried to overcome some of these difficulties by establishing government experimental stations and breeding centers, distributing seed to the farmers, selling plows to the natives at cost price, and opening up the interior by a network of good roads and railway lines.

PHYSICAL FEATURES

Location and Area

Angola, the largest of the Portuguese colonies, lies on the west coast of Africa between latitude 6° 10' and 18° 20' south, with the exception of the small enclave of Cabinda, which is situated north of the estuary of the Congo. It is bounded on the

Junior Agricultural Economist, Office of Foreign Agricultural Relations. Based in part on material prepared for the Office of Foreign Agricultural Relations by Samuel B. Coles, agricultural missionary in Angola.



FIGURE 1.-Map of Angola showing principal livestock and crop areas.

north by the Belgian Congo, on the east by Northern Rhodesia and Belgian Congo, and on the south by Southwest Africa. Cabinda is bounded by French Equatorial Africa on the north and Belgian Congo on the east and south. Angola, together with Cabinda, totals 487,788 square miles in area, and its coastline is about 1,000 miles long.

The colony is skirted by a stretch of coastal plain, which is about 150 miles wide in the north, and which gradually narrows until in the extreme south it almost disappears. Behind this flat or gently undulating country, the ground rises gradually until it reaches the main plateau; in some places by distinct terraces, in others

through the rich forest belt. The plateau has an altitude in the north of from 3,000 to 3,500 feet. Toward the south the elevation increases until, in the center of the country, it reaches from 7,000 to 8,000 feet. Further south the altitude decreases.

Climate

Angola's climate is much cooler than its latitude would lead one to expect because of the high altitude of the interior and the cool sea current, known as the Benguela Current, which runs northward along the coast to within a few degrees of the equator. The temperature decreases from north to south and from the coastal plain to the plateau. In Cabinda, it ranges from 72° F. in the cool season to 79° F. in the hot season. At Luanda, the average temperature is 74° F. and the range about 10 degrees. At Mossamedes, the average is 69° F., at Malange, 66° F., and on the Benguela Plateau slightly less. In the higher altitudes the daily range of temperature is considerable.

There are two seasons - the hot, or rainy; and the cool, or dry. The former lasts from the end of September to the middle of May; the latter, the remaining 3.5 months. The hot season, in turn, is divided into two periods. In the first, from October to December, the lesser rains fall; in the second, from February to the beginning of May, the temperature is highest and the rainfall heaviest. In January there is almost invariably a break of several weeks, during which no rain falls. During the dry season, some of the smaller rivers are nearly dry, their existence being recognized only by long, sandy stretches, where water may be obtained by digging wells.

One authority describes the humidity of Angola as follows (9, p. 115):¹

"Relative humidity varies greatly from place to place. Along the coast and in the Congo Basin, it is high the year round (from 70 to 86 per cent). In the highlands of Loanda and Benguela the average for the year is about the same, but the range lies between 65 per cent in the dry months and 88 per cent in the period of rains. In the highlands back of Mossamedes the air is much drier, relative humidity ranging from 32 to 66 per cent. A special peculiarity of the Angolan climate is the fog which, throughout the dry season, rises about 9 a.m. and swathes the whole region. So characteristic is this fog that its name, 'cacimbo,' is used by the settlers to denote the dry season."

Rainfall

Rainfall varies considerably from district to district and from year to year. It is lowest along the coast, where south of latitude 7° the average annual precipitation is under 20 inches. At Luanda, for instance, the average rainfall is about 15 inches, and to the south it decreases steadily. In the extreme south of the coastal belt there is practically no rainfall. Northward from latitude 7° precipitation increases, and in Cabinda it ranges from 40 to 60 inches annually. This probably approximates the average rainfall over the greater part of the plateau.

Vegetation

The area of Angola is made up of relatively dry forest land which predominates and occupies 55.8 percent of the total area, and high-grass savanna and acacia tall-grass savanna with 22.6 and 11.1 percent, respectively. The tall-grass savanna and dry-forest regions are known as the "warm weather crop belt"; here cotton, peanuts, and livestock flourish. In the high-grass savanna cacao, rubber, bananas, tropical fruits, and vegetables are grown. The acacia desert-grass-savanna region is located along the central coast region and is most suitable for wildlife and grazing of cattle, sheep, and goats. Only drought-resistant crops, such as peanuts, will grow in it.

¹ Italic numbers in parentheses refer to Literature Cited, page 115.

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## Soils

The soils of the country fall into three categories: (a) Red loams, (b) reddish-brown lateritic soils; and (c) laterite soils. These soils develop in warm and damp climates and are characteristic of soils throughout western Africa.

The soils of northern Angola are often light in texture and sandy and reddish in color, whereas the subsoil is generally much heavier and frequently clayey in nature. There is a tendency under the prevailing humid conditions for the soils to be partially or even wholly leached; the laterites are particularly affected, and the removal of agriculturally valuable lime carbonate has resulted from such leaching (2, p. 23).

In the laterite soils, alumina is always found in the form of aluminum hydroxide and there is an absence of combined silica. Shantz and Marbut state (8, p. 126): "developed under a very high rainfall, probably a minimum of 50 inches - laterites have been subject to the process of leaching to a much greater extent than any other soil group."

In the red loams, aluminum hydroxide is almost entirely absent, and they have a high percentage of aluminum silicate. The amount of leaching they have suffered is less than the laterite, and generally the conditions for successful agriculture are favorable. The red loams occupy large sections of Angola where precipitation does not exceed 50 inches (2, p. 24).



FIGURE 2.-Plow drawn by 16 oxen breaking a field in the Elombo River Valley.

## PEOPLE

Angola's population at the last census (1934) totaled 3,098,281, of which 3,020,626 were natives, 18,957 of mixed race, and 58,698 whites. The country is sparsely inhabited with an average density of 6.3 persons per square mile.

The people of Angola are made up of many large tribes and subtribes. All belong, however, to the Bantu stock, and Kongo and Umbundu are the principal languages spoken by the natives. The native peasant has little if any capital. His assets are his family, home, a few primitive agricultural implements, and one or two sheep and goats. His needs are simple. Most of the natives grow enough food for their families and the payment of taxes. For this reason they are

largely economically self-sufficient. A food shortage would be caused only by unfavorable weather conditions or insect plagues, and these occur rarely. However, some progress has been made in educating and stimulating the people; consequently they are fast learning that farms may offer them a source of cash income, and they are engaging more and more in commercial farming, thereby increasing the cultivation of cash crops.

Manioc, corn, and millet are the principal staple foods grown by the natives and comprise the major part of their diet. In some districts they are usually supplemented by vegetables. The leaves of the bean, squash, or manioc plants are utilized, but peas, okra, and other plants are also part of their fare. Manioc leaves are not prepared in the same manner as other vegetables but are first pounded into a paste, cooked, and seasoned with palm oil, salt, and pepper and then used as gravy or soup. Sweetpotatoes are eaten between meals and taken along on journeys. All the cooking is done in pots



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over open fires, and as a rule all the food is boiled. Oilseeds and vegetable oils are used as seasonings. In some districts, chiefly Benguela and Mossamedes, milk and butter are produced and included in the diet.

Meat, even among the cattle-raising tribes, is not a regular part of the native diet. Natives will eat meat if one of their domestic animals dies or if a wild animal is caught. Except on feast days healthy animals are rarely killed for food.

The natives regard their cattle very highly; it is said (6, p. 22):

"The majority of the Bantu tribes combine agriculture with cattle-keeping; it is only those who inhabit forest or tsetse areas that have no cattle, and among the rest, attachment to their cattle is so pronounced that it is often regarded as the most characteristic element in their culture. Cattle are not only the most prized form of wealth, but are often surrounded by religious and magical beliefs and practice."

LAND UTILIZATION

Land Policy

Most natives live in tribal groups and land is shared communally. The head of the tribe allots certain portions of land to each family, on which they cultivate their crops. On May 9, 1901, all land not occupied on that date was declared state domain. This decree did not keep concessionaires from buying up tracts of native land, and in 1919 certain areas had to be reserved for the exclusive use of the native population. The natives were not restricted to these areas but could also occupy unalienated land. In 1927 a law was passed allowing the natives an area five times that in actual occupation. Natives cannot be required to leave an area except on payment of compensation and on a guaranty that an equal amount of land will be made available for them in the reserves. Land left uncultivated for more than a year is regarded as vacant and reverts back to the State. Provisions exist for granting natives private rights to land that they may have occupied outside of the reserves, but only 3.7 percent of the land in possession of the natives is held under individual title (6, pp. 796-797).

Granting of temporary concessions is the present method of land alienation. The maximum area of a single concession is 50,000 hectares (123,550 acres), and in some regions it is limited to 10,000 hectares (24,710 acres). Certain conditions must be met by prospective concessionaires in order to obtain confirmation of title. The concessionaire must spend 200 times the price of the land on improvements. If the land grant is properly developed, the owner is exempted from the land tax for 11 years; if not, additional taxes may be imposed by the Government. At the end of 10 years, the State may revoke the whole or part of the concession for failure to develop.

Native Agriculture

In 1938 there were approximately 2,171,000 acres of land under cultivation, of which about 95 percent was in native hands. Each member of the household has his particular duties to perform, and in the agricultural tribes women and children, mainly, tend the crops. The fact that the women are given this responsibility is considered a measure of their importance in the community. Male members of the family do all of the clearing of the land.

It is stated (1, p. 36):

"Clearing new land covered with thick bush or forest is a laborious operation; and, when the land is cleared, an enormous amount of labor is continually required to prevent the weeds and undergrowth from encroaching on the cleared area and destroying the crop. The farms therefore tend to be small and intensively cropped, and are indeed more like gardens than farms. Mixed cropping is the general practice, and the plants are spaced as closely as possible."



FIGURE 3.—Young man with the first plow ever used in the Dala area, near the head of the Cunene River.

In recent years, however, native cultivation of cash crops has increased, and men are beginning to take over the care of these crops, largely to pay the tax levied by the Government. Taxes are used as a means of increasing production. Since subsistence crops do not command high prices on the market, the natives are forced to turn to the cultivation of cash crops. If a native is unable to pay his taxes, he has to work for others, usually large concessionaires, in order to discharge his obligation. In 1929 the annual tax per inhabitant was equivalent to about 91 cents.

A system of shifting cultivation is used, whereby, according to Lord Hailey (6, p. 879), "the ground is used for as many years as it remains fertile, usually three or four years, and is allowed to revert to bush again until it has regained its fertility or until it is again required for use."

The native method of agriculture allows the land to grow up naturally to brush. Profuse growth of grass and weeds gives protection against erosion and helps to build up the soil. It is said (6, p. 881):

"The months are marked by a routine of clearing bush or tree cutting, fertilizing, sowing of crops, fencing, and harvesting, which forms the most important activity of tribal life."

Farm implements and machinery

The hoe and axe are the basic implements of cultivation used by natives. The standard hoe weighs 1.5 pounds and has a handle 18 to 24 inches in length. In 1938 there were about 2 million hoes and over 600,000 axes in use. The plow is a new implement among the Africans and is not very widely used. In recent years, and especially since 1939, the Government has tried to encourage the use of plows by selling them at cost price to the natives. Tractors are scarce and are usually found only on large plantations. The cost of farm machinery and fuel is very high, and the majority of natives cannot pay the prices. Gasoline sells for 50 to 60 cents a gallon, oil from \$1.00 to \$1.50 a gallon. These high prices are in sharp contrast to the low prices paid for farm commodities and make it almost impossible for the natives to use farm machinery of any kind.

Draft animals

Mules and horses are found in the Cunene Basin from Capelongo to Mossâmedes. They are used as draft animals in Huila and Mossâmedes, but their use is restricted mainly to the European population. The Africans do not use oxen as work animals to any great extent. Before the advent of the automobile, European traders used oxen for long hauling, and mules were used in the coastal cities to haul freight and draw coaches. Small numbers of mules are still used for these purposes.

Irrigation

Angola is well suited to large-scale irrigation because of its many large rivers in the upland area. As yet, the Government has not initiated any large-scale irrigation projects. By employing irrigation at government agricultural stations, results have been demonstrated, and its use thereby encouraged. Some irrigation is also practiced on many of the large plantations and farms owned by Europeans. The systems used consist chiefly of diverting water from a river into a large ditch or canal and thence through smaller canals to the places where the water is required. It is roughly estimated that about 25,000 to 40,000 acres are irrigated by this system, occasionally with the aid of motorized pumps. On smaller tracts of land, hand pumps are powered by cheap native labor. In this manner sugar plantations and some cotton plantations are irrigated. Irrigation is also employed in the production of rice, some corn, truck vegetables, fruit trees, palm trees, and about 90 percent of the wheat grown in the colony. There is some use of irrigation on land cultivated by natives, and as a result they are producing a better grade of coffee and fruits as well as increasing the yield.

In 1939 the Angolan Government was studying several projects for the construction of irrigation canals and dams in various regions of the colony that would have encompassed about 62,000 acres of land for the cultivation of cotton, rice, and corn. These projects are not likely, however, to be carried out until after the war.

GOVERNMENT ORGANIZATION AND POLICY

The constitution under which Angola and other Portuguese colonies are at present governed is based on the Colonial Act of July 1930, which was reenacted in 1933 upon the adoption of a new constitution by Portugal and completed by the Colonial Charter of the same year. The administration of the colonies is delegated to the Minister of Colonies, the Colonial Governor, provincial governors, and minor local administrative bodies. By the terms of the Colonial Act certain matters, such as the establishment or modification of colonial constitutions, the conclusion of agreements with foreign powers, the authorization of loans requiring special guaranties, and the granting of concessions need the approval of the Portuguese National Assembly. The Minister of Colonies is responsible for the general colonial policy and administration. He, in turn, is assisted by two advisory bodies, the Superior Colonial Council and the Conference of Colonial Governors. Directly under the Minister is the Colonial Governor with his advisory council, consisting of appointed and ex officio members and those elected by various economic organizations. This advisory council must be consulted on all legislative measures. Elected members must be of Portuguese nationality and European status.

At each of the provincial headquarters there is a provincial junta or council at the head of which is a governor. The membership of these councils is made up of appointed officials, members elected by economic organizations or principal taxpayers, and a representative of each local governing body in the colony. These agencies have statutory powers in matters concerning local finance, public works, and public assistance; they also control the activities of the local governing bodies and may disallow their measures and modify their budget estimates.

Local governing bodies are responsible for the maintenance of public security and hygiene, the regulation of transport, and the organization of markets, slaughterhouses, and cemeteries. Subject to disallowance by the provincial junta, against which they may appeal to the Colonial Governor, they control the administration of

public property and the organization of public works. There are three types of local administrative bodies, which perform more or less similar functions; the chairman of each is appointed in all cases, and membership consists of both appointed and elected officials.

The Colonial Act of July 1930, according to Lord Hailey (6, p. 213), "lays down general principles of native policy with which local legislation must conform; these include provisions that native rights in land must be respected when alienations are made and that natives may not be compelled to work for private employers."

Aid to Agriculture

Of late the colonial authorities have taken a deep interest and an active part in the agricultural development and production of the Africans. In 1939 the Government distributed 618 short tons of corn and 89 short tons of wheat for seed among the African farmers. This was increased in 1940 to 730 short tons of wheat and 1,182 tons of corn. During 1939-40, 2,289 plows were sold to the natives at cost price. The corn and wheat received were returned at the end of each harvest plus 1-percent interest. The interest charge is for cleaning the grain before it is sold.

The distribution of seed by the Government has been hailed by Africans as a step in the right direction. An agricultural experimental school has been set up by the Administration in the district of Cuíma, about 50 miles south of Nova Lisboa. Corn and beans are cultivated there for distribution. The Government also maintains a nursery where many varieties of fruit are cultivated for free distribution. The various stock-breeding centers will be discussed under livestock.

In 1930-31 Angola had a total of 124 native schools with 6,537 pupils. Of these 58 were managed by the State, 28 by Catholic, and 38 by Protestant Missions. There is a Central College at Luanda and a National College at Huila. The government and mission schools stress mainly agricultural education. In 1940 the agricultural experimental school in Cuíma had 20 students, who were being trained as agricultural extension agents.

Measures to Ensure Labor Supply

There is an abundant potential labor supply in the country, but difficulty is experienced in inducing the inhabitants to work for wages. Since all the natives grow their own food, they do not have to depend to any great degree on securing employment. The Government, in order to ensure for itself an adequate labor supply, requires every adult male to work 5 days a year on public projects. However, each person can buy himself off by paying a sum of money at a rate fixed by local decree. The Government benefits either way, because, in order to pay for his release, the native will probably have to increase his crop production to raise the money he needs.

The method of recruiting labor was at one time much akin to slavery. Employers wanting labor applied to the local administrator, who obtained the men required through the native chiefs, both the chief and the official receiving so much for each man supplied. This led to many abuses and on November 29, 1922, payments to tribal chiefs for recruiting were abolished. In 1928 officials were limited to pointing out suitable places for recruiting and to giving advice; the Colonial Law of November 15, 1933, formally prohibited official intervention in aid of recruiting. The administration retains, however, the right to take steps for the "educational" encouragement of labor. The use of "educative compulsion," as it is sometimes called, is defended by some authorities when it is employed to increase production and generally to develop the colony and not to benefit private enterprise. However, officials of the Government

are allowed to hold a share in private enterprise, thereby laying the use of "educative compulsion" open to suspicion (6, pp. 633-635).

INDUSTRY

Angola's industrialization is still in the embryonic stage. Fish curing is one of the principal industries and is centered around Mossâmedes and Porto Alexandre. During 1934-38, 1,764 short tons of dried fish were exported, chiefly to the neighboring African colonies. A few plants extract palm oil and manufacture soap as a byproduct. There is a supply of vegetable oils and animal fats from which a soap industry could be developed. A steadily growing demand for toilet soaps exists in Angola. More than half the laundry soap used in the colony is produced locally, but 95 percent of all types of toilet articles and soaps are imported from foreign countries. There are several limekilns, brick factories, repair shops, bakeries, slaughterhouses, flour mills, etc. Most of the industries are controlled by Europeans. Mining activities cover diamonds, copper, iron ore, and gold. Some salt from sea water is produced for export.



FIGURE 4.--A tamping wheel used for mixing clay for making brick.

STORAGE AND REFRIGERATION FACILITIES

As yet the Africans have not produced enough of any one crop to encounter any difficulties in the storage of surplus commodities. But, as better farming methods are instituted among the people, the problem of adequate storage will arise.

Storage facilities of the traders in the "bush" and at the terminal points are inadequate. Hundreds of tons of grain are destroyed by insects and rats. Corn weevils infest the grain bins that are not properly fumigated. As a rule, the bins in the bush are built with dirt floors and grass roofs, which make them accessible to rats, white ants, and other insects. The bins at the railhead are made of brick but have earthen floors, which if tiled would be impervious to white ants and rats.

Refrigeration facilities exist only on a small scale because of the fact that the fruit industry is relatively undeveloped and surplus fruit is either canned, dried, or consumed in the colony. Again, the urban population is not large enough to necessitate the killing of animals for food to last more than 2 days at a time, and climatic conditions are such that meat keeps well without refrigeration. In the coastal cities, some ice is used for a few months during the year, but in the interior ice is not used at all. Fish brought from the coast to market has to be kept on ice. In some of the larger cities ice plants are found, but their output is very small.

TRANSPORTATION

Railways

The railroad system consists of four roads with a total mileage of 2,080 miles. In 1937, 259,568 passengers were hauled and 629,180 short tons of freight. The Luanda

railway runs 260 miles from Luanda to Malange and has four branch lines. It taps a good corn, sisal, and coffee region. This railway is government-owned and as yet has not proved to be a financial success. The Benguela railway extends for 808 miles from the Port of Lobito to the Belgian Congo border. This line is mainly British-controlled. In 1936 a scheme was inaugurated for agricultural development, promoted by the railroad, whereby Portuguese settlers could lease plots of land along the line of the railway. The company was to clear the land, provide temporary shelter, tools, etc. The settlers would pay to the company, in lieu of rent, a certain percentage of their crops. No results have been reported to date. The Amboim railway taps the coffee district and runs for 64 miles from Pôrto Amboim to Chindinde.

Highways

Because of the network of good roads in the colony, agricultural products are finding their way to the markets of the world. Angola has about 17,000 miles of good roads, many of which are hard- and well-surfaced, and approximately 20,000 miles of secondary roads. Almost 6,000 miles of road are in the districts served by the railways and act as feeders to the main lines.

Rivers

During the early years of Portuguese settlement, use was made of river transportation; 1,870 miles of waterways were used during that period. The introduction of the ox wagon by the South African Dutch and the use of caravans caused river transportation to fall off. Later the advent of the automobile and the railroads with their centers far removed from the rivers killed it entirely, except in the enclave of Cabinda.

Ports

Lobito, a fine natural port, is one of the best in West Africa. The docks are modern and have a capacity for 10 to 12 ships, and 75 or 80 can be accommodated in Lobito Bay. It is the terminal point of the Benguela railroad. A government port authority with special powers has been instituted at Lobito to control the development of the port, and extra dues are levied there, consisting of anchorage and quay dues. These are reduced for Portuguese vessels and those calling regularly.

The Port of Luanda is well sheltered and can accommodate 104 ships. It is the terminal of the Luanda-Malange Railway. The harbor is roomy and well-protected, but large ships have to anchor about 3 miles from the landing quays.

The remaining ports of Angola, including Ambrizete, Ambriz, Pôrto Amboim, Novo Redondo, Benguela, and Mossâmedes are open roadsteads, with the exception of the Port of Santo António do Zaire, small ports on the Congo River, and the fine but little used harbors of Porto Alexandre and Baia dos Tigres, south of Mossâmedes. Each minor port serves a small hinterland.

AGRICULTURAL PRODUCTION

Crops

Manioc is the chief native food and is widely grown in Angola. Production is heaviest in the districts of Zaire, Malange, and Lunda. Very little is exported because almost all the crop is consumed by the natives. Production in 1939 totaled 301,590 short tons.

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It is a hardy plant which grows well throughout the dry season. No crop grown by the natives is more highly prized and affords so sure a protection against crop failure by drought. It can be cooked and served in the same manner as potatoes or roasted when it is in the tuber state. However, in the tuber state it will last only about 2 or 3 weeks at the most. Better use is made of the flour, which if kept in a dry place will last for a year or more. In some districts, the leaves of the manioc are eaten as vegetables.

Corn is usually eaten in the form of meal and is prepared in the following manner. The corn is first dampened and placed in a mortar; then after being pounded with a pestle until the husk comes off, it is covered with water and kept for 8 to 10 hours or until it becomes soft enough to be pounded into meal. After pulverization, the corn is dried from 4 to 5 hours on mats or flat stones and is then ready for use. All the work is performed by women and girls. This method is quite wasteful, since 25 percent of the corn is lost and its fat and sugar have been washed out, leaving only the bulk.

Corn, according to one report (3, p. 10),

"is principally grown on the Benguela plateau, and its cultivation is mostly carried on by natives. Europeans have not been too successful with this crop.... Two drawbacks are encountered on the plateau. The rainfall is generally excessive - probably about 60 inches a year - and the subsoil is often poor. The natives overcome these difficulties by raking the top soil into ridges of from 4 to 6 inches in height, which give the additional depth of good soil required and serve at the same time to drain off the surplus moisture."

The acreage under cultivation during 1934-38 averaged 1,300,000 acres. During the same period about one-third of the crop was exported. Portugal was the main country of destination, but Belgium and Germany were also important markets. Exports increased from 95,000 short tons in 1934 to 170,600 in 1941.

The corn exported from Angola has not been graded as of good quality chiefly because of a lack of cleaning machinery and storage facilities.

Wheat production has taken on new impetus within the last 4 years. The Government is distributing tons of selected seed among the Africans and is selling them plows at cost price. Wheat is grown in the Malange area and on the higher parts of the central plateau.

Production is rapidly increasing but is somewhat restricted by the fact that wheat is a cool-season crop and the rainfall during that season is scarcely adequate. Irrigation is used a great deal in wheat cultivation. Exports for 1938 totaled about 2,400 short tons, almost all of which went to Portugal. Due to lack of adequate milling centers, Angola has to import much of its wheat flour. Plans are being drawn up for milling in Angola most of the wheat consumed in the colony.

Rice growing was introduced about 35 years ago in the county of Suswa. The natives of that area grow in the district of Bihe most of the rice that is now being exported. The Government of Angola has not particularly encouraged rice growing, even though many regions in Angola are well adapted to this crop. Approximately half the interior is suitable for rice growing, and all the coastal region could grow swamp rice. In order to induce the natives to increase production, price incentives and hulling machines would have to be furnished. At present, there are only three centers



FIGURE 5.-A native chief and his wheat harvest from seeds furnished by a mission in Angola.



where hulling and cleaning are carried on: Silva Pôrto, Cuíma, and Sá da Bandeira. Production of rice averaged 6,173 short tons in 1934-38, of which 1,478 tons, or about 20 percent, were exported. In 1941, exports totaled 2,307 tons.

Beans are cultivated in practically all parts of the colony. They constitute a staple item in the diet of the natives and are important in the export trade as well. Production for 1934-38 averaged 30,864 short tons, of which about one-fifth, or 5,451 tons, were exported. Exports more than doubled in 1941 when 11,241 tons were shipped.

Peanuts grow well in all parts of Angola. The crop is grown largely for consumption by the natives. Because of the low prices paid to the natives and the low oil content of Angolan peanuts, the peanut industry has not been developed on a large scale. With proper stimulation, the production of peanuts for export purposes could probably be considerably increased. The crop of unshelled peanuts during 1934-38 averaged 6,173 short tons. Exports for this same period averaged about 441 short tons, or only 7 percent of total production. In 1941, the figure dropped to 254 short tons.

The oil palm grows readily in the northern half of the coastal plain, being particularly plentiful in the valley of the Cuanza and numerous small rivers between it and the Congo. The palm plant has a much wider range of growth than the coconut plant. It grows in the river valleys 150 miles into the interior. If a study were made to determine how far inland the oil palm can grow, cultivation might be greatly expanded.

In extracting the oil, the Africans still use old primitive methods, which are slow, wasteful, and unprofitable. As a result, many natives have allowed their plantations to become run-down, and some have abandoned them entirely. European concessionaires have been quick to take up these plantations, and more and more the cultivation of the oil palm is being carried on by European planters. Large plantation owners have machinery available for extracting the palm oil, which enables them to operate more quickly and efficiently. A few large firms, particularly the Companhia Agricola de Angola and Cazengo Companies, export oil and kernels, chiefly to Lisbon.

Most of the products of the oil palm are used only for local consumption, and exports are relatively small. Production figures are difficult to determine, since the palm tree grows wild and no accurate figures are available for local consumption. Exports in 1936-40 averaged 6,316 short tons of palm kernels and 2,966 tons of palm oil.

Coconuts are grown all along the coast of Angola, principally in the Cabinda Enclave and the districts of Luanda and Zaire. In order to increase production, a nursery and experimental station should be established where the native farmers could receive tested plants. The farmers in turn should be given small holdings in which to plant and cultivate coconuts. This system would eliminate the labor problem that would arise if the plantation method were used rather than small plots. Exports for 1934-38 averaged 6,550 short tons. There was a decrease in 1941, when 4,504 tons were exported.

Castor and sesame seed are cultivated by the natives as casual crops only. The product of such plants as may come up around the house and in the cornfields is gathered and exchanged for salt, palm oil, soap, etc. A few natives grow enough castor-beans to sell for money. Exports rose from 860 short tons in 1934 to 6,074 in 1938. But in 1941 exports totaled only 1,221 tons. The production of sesame seed averaged 661 tons during 1934-38, and exports for the same period averaged 551 tons. Exports showed an increase in recent years from 110 short tons in 1934 to 970 in 1939.



Of the fruits, oranges, bananas, apples, pears, and strawberries are grown but are not exported, mainly because of the lack of shipping facilities with refrigerating space. Even the local demand on the coast is not properly supplied, because much of the fruit spoils en route.

Sugar is fast becoming one of the most valuable export products of Angola. It is only grown on plantations situated near Luanda, Benguela, and Malange. Labor in these areas is cheap, and only a small outlay of money is necessary in preparing the land for planting. Sugar enjoys protection in the Portuguese market. Sugar exports increased from 21,726 short tons in 1934 to 43,456 in 1941. Practically all went to Portugal.

Coffee is one of the most valuable agricultural products of Angola. It is produced in the wooded zone between the coastal plain and the plateau. Robust coffee grows wild in the coastal regions, whereas Arabian coffee does best in the highlands and requires little water during the dry season. Although Arabian coffee is a much more valuable commodity, it is not such a certain crop. A considerable portion of the coffee crop grows wild and is picked by the natives.

At present the grading of coffee is still in a backward condition. Inadequate grading hampers expansion in existing markets and also the finding of new outlets. According to an official publication of Angola, producers are more concerned with increasing the amount exported than with attaining higher classification. The Government, by legislation and otherwise, is making concerted efforts to rectify this defect. Suggested improvements include the setting up of an experimental testing center, in order to maintain uniform quality and output, and the securing of adequate machinery for grading and processing.

During 1937-41 production of coffee averaged 18,938 short tons a year, of which 17,611 tons or about 93 percent was exported. The remainder was presumably consumed in the colony.

Some cacao is grown in Angola, but, except in Cabinda, the country does not seem to be wet enough for its cultivation. Exports during 1937-41 averaged 285 short tons.

Sisal growing began in 1914 but the crop is still comparatively small. It is produced chiefly on plantations; two German companies and one British firm control most of the output. Exports increased from 4,740 short tons in 1934 to 8,267 in 1938. In 1941 only 3,724 tons were exported.

<sup>2</sup>The cultivation of cotton in Angola began as early as 1820 but in 1858 exportation (which means production) had reached only 22,000 pounds. The Civil War in the United States gave an impetus to its cultivation and for several years thereafter production maintained a figure above 2,000,000 pounds but dropped back gradually to 330,000 pounds in 1884.<sup>2</sup>

In recent years the Colonial Government has carried on experiments with cotton in various parts of the colony. Today there are to be found Portuguese cotton plantations in the districts of Mossâmedes and Luanda. Experiments have been carried on with three varieties of American cotton on a Portuguese plantation in the Cunene River Basin of Mossâmedes, at nine mission schools, and at the government experimental station at Cuima. The results were reported to have been very satisfactory.

Cotton is cultivated mainly in the low country inland from Luanda and on the Malange Plateau. It is largely a plantation crop ginned and exported by Europeans. Exports of cotton increased from 992 short tons in 1934 to 5,732 tons in 1939. Usually all exports were shipped to Portugal. Cottonseed also plays an important

<sup>2</sup> PINKERTON, J. L., ANGOLA FROM THE STANDPOINT OF AMERICAN COMMERCE AND CAPITAL, U. S. Cons. Rpt. [Excerpts] pp. 25-33, 1923. [Typewritten.]

role in the export trade, and exports increased from 209 short tons in 1934 to 3,340 in 1939 and 4,045 in 1940. Production of cotton for 1942 is estimated at 5,974 short tons, which represents a large increase over previous years. This was due to favorable weather conditions and active aid to growers provided by the Government, i. e., establishment of experimental farms and the selection and distribution of seed.

The country is particularly well suited for the cultivation of tobacco, and 6 percent of the total acreage in Africa is planted in Angola. The natives know how to grow tobacco, but they do not know how to cure and process it. They produce it mainly for their own use but export a small quantity. During 1934-38, average annual exports amounted to 489 short tons. In 1941 exports increased to 1,111 tons. There are three tobacco factories in Luanda, which supply Angola's demand for cigarettes.

The supply of beeswax is derived entirely from the natives, whose methods are primitive and uneconomic. Crude hives are put in the treetops to collect the wax, and fires are then lit to drive away the bees, which perish in large numbers. Sometimes the natives merely seek for the nests of bees in trees and on finding them kill the bees, often cutting down the trees. In spite of these crude methods, Angola holds a prominent position among the world sources of beeswax. This is due to the vast extent of bee-frequented country. The Government of Angola is endeavoring to teach the natives other methods and to that end has established two propaganda centers of apiculture.

Present production probably could be considerably increased in a given season if trading centers were established throughout the wax-producing areas and if uniform and guaranteed prices were paid. Approximately 1,404 short tons were exported on the average during 1937-41.

Rubber grows wild throughout the forest region and is particularly abundant in the Lunda district. At one time, rubber was the most important export crop of the colony. Today it plays a very minor role. The rapid decline in prices due to increased production in Malaya and the Netherlands Indies, together with the poor handling of Angolan rubber, caused a sharp decline in exports. The rubber industry could probably be revived in Angola if trading centers with machines for washing and reprocessing the rubber were established, and guaranteed prices and markets were offered the natives. Annual exports averaged 2,704 short tons during 1910-14 but fell to 87 tons in 1922. They averaged only 117 tons during 1935-39. As a consequence of the war, there may be some improvement in output; over 600 short tons were estimated for 1942 and over 1,700 for 1943.

### Livestock

Although Angola has 475,000 square miles of grazing land, an unfavorable climate and the presence of the tsetse fly and ticks have rendered much of this area, especially in the northern part, unsuitable for livestock grazing. From the Benguela railroad southward, however, the country is well adapted to stock raising, particularly cattle raising. In 1935 there were about 2,000,000 cattle in the colony, of which a little over 1,000,000 head were in the district of Huila. Prior to 1932 exports went chiefly to the Belgian Congo. Growing trade barriers lost to Angola the markets for cattle in these nearby territories, and the export trade had to seek new outlets (5, p. 26).

In the face of considerable difficulties, Angola finally established trade in cattle with the mother country. Poor demand for Angolan livestock was due to a reputation, at least partly undeserved, for tough and unsuitable meat (5, p. 26). At best

Angola's meat is graded as second class. Exports during 1929-33 averaged 8,200 head, and this figure dropped to 7,100 during 1934-38. In 1937 it was thought that this fall in exports would be remedied because of a special quota concession made by the home country and by the opening of a demand in the French Congo. However, in 1938, exports of cattle totaled only 4,000 head, and in 1941, 3,307. Export trade in meat could probably be developed if refrigeration facilities were available at ports.

Considerable efforts are being made to raise the quality of the livestock. Angola has a veterinary laboratory in the highland and stock farms in the Ganda, Humpata, Cuanhama, and Quilengues districts. With the exception of Humpata, which specializes in the production of wool, milk, and draft animals, these districts are mainly devoted to the breeding of cattle and sheep for export. Veterinary and technical assistance in animal husbandry is given to the natives.



FIGURE 6.-Oxen brought in to be trained for use in plowing Angolan fields.

Sheep are raised in the south, and goats are seen almost everywhere. Pigs are mostly found in the Benguela district. In 1935 there were 169,532 sheep, 553,189 goats, and 347,805 hogs in the colony. Average annual exports of hogs and goats during 1934-38 totaled 1,800 and 900 head, respectively.

TABLE 1.-Total number of livestock in Angola, 1930, 1931, and 1935

| YEAR       | CATTLE      | SHEEP <sup>1</sup> | GOATS       | HOGS        | TOTAL       |
|------------|-------------|--------------------|-------------|-------------|-------------|
|            | : Thousands | : Thousands        | : Thousands | : Thousands | : Thousands |
| 1930 ..... | 1,480       | 140                | 315         | 272         | 2,207       |
| 1931 ..... | 1,570       | 155                | 363         | 287         | 2,375       |
| 1935 ..... | 1,929       | 178                | 553         | 348         | 3,008       |
|            | :           | :                  | :           | :           | :           |

<sup>1</sup> Including a special kind of African sheep.  
Anuário estatístico de Angola, 1938.

FOREIGN TRADE

Portugal maintains preferential trade arrangements with its colonies. According to the decree of 1934, products exported from Angola to Portugal pay only 40 percent of the import duty, except for such commodities as sugar and tobacco on which a higher preference already exists. This same treatment is accorded to products from Portugal imported into Angola. In addition, official harbor rates at Lisbon are reduced by 20 percent for Angolan goods, and the Lisbon harbor authorities are permitted temporarily to reduce rates by a further 50 percent on corn, coffee, cacao, and frozen meat (4, p. 26). Imports into Angola from Portuguese colonies are charged 50 percent of the import duty. •

Exports

Total exports during 1938 were valued at \$21,624,000. Belgium was the largest importer of Angolan goods (chiefly of diamonds), accounting for 44.6 percent of the



TABLE 2.—Principal agricultural exports from Angola, 1929-41

| COMMODITY                    | AVERAGE<br>1929-33                                                              | 1934 | 1935 | 1936  | 1937  | 1938  | AVERAGE<br>1934-38 | 1939  | 1940  | 1941  |
|------------------------------|---------------------------------------------------------------------------------|------|------|-------|-------|-------|--------------------|-------|-------|-------|
|                              | : 1,000 : 1,000 : 1,000 : 1,000 : 1,000 : 1,000 : 1,000 : 1,000 : 1,000 : 1,000 |      |      |       |       |       |                    |       |       |       |
|                              | : short : short : short : short : short : short : short : short : short : short |      |      |       |       |       |                    |       |       |       |
|                              | : tons : tons : tons : tons : tons : tons : tons : tons : tons : tons           |      |      |       |       |       |                    |       |       |       |
| Corn .....                   | 71.9                                                                            | 95.0 | 50.9 | 126.9 | 126.3 | 141.9 | 108.2              | 122.3 | 107.9 | 170.6 |
| Sugar .....                  | 18.9                                                                            | 21.7 | 30.5 | 32.0  | 28.8  | 35.4  | 29.7               | 39.5  | 37.3  | 43.4  |
| Coffee .....                 | 11.9                                                                            | 12.9 | 11.3 | 21.6  | 18.1  | 19.2  | 16.6               | 22.9  | 12.2  | 15.6  |
| Coconuts .....               | 6.7                                                                             | 8.0  | 5.3  | 4.5   | 7.5   | 7.5   | 6.6                | 7.2   | 7.6   | 4.5   |
| Palm kernels .....           | 6.7                                                                             | 7.6  | 5.3  | 4.5   | 6.4   | 6.5   | 6.1                | 6.5   | 7.6   | -     |
| Sisal .....                  | 1.3                                                                             | 4.7  | 5.0  | 6.1   | 6.0   | 8.3   | 6.0                | -     | 7.5   | 3.7   |
| Beans .....                  | 3.4                                                                             | 3.2  | 4.2  | 5.8   | 9.1   | 5.0   | 5.5                | 5.7   | 12.1  | 11.2  |
| Castor-beans .....           | 1.2                                                                             | .8   | 4.8  | 2.8   | 4.4   | 6.1   | 3.8                | 4.6   | 4.1   | 1.2   |
| Palm oil .....               | 4.3                                                                             | 4.3  | 1.9  | 1.0   | 3.3   | 4.0   | 2.9                | 6.0   | 5.5   | 3.6   |
| Cotton .....                 | .8                                                                              | 1.0  | 1.5  | 2.4   | 3.7   | 3.0   | 2.3                | 5.8   | 3.9   | 4.8   |
| Rice .....                   | .6                                                                              | 1.2  | .5   | 1.1   | 2.4   | 2.2   | 1.5                | 1.6   | 1.2   | 2.3   |
| Sesame .....                 | .5                                                                              | .1   | .4   | .4    | .9    | .8    | .5                 | 1.0   | -     | -     |
| Peanuts (unshelled) ..       | .2                                                                              | .1   | .2   | .6    | .7    | .7    | .4                 | .7    | .4    | .2    |
| Cacao .....                  | .3                                                                              | .3   | .3   | .5    | .2    | .4    | .3                 | .4    | .3    | .2    |
| Tobacco .....                | .5                                                                              | .5   | .6   | .6    | .5    | .3    | .5                 | .6    | .6    | 1.1   |
| Seeswax .....                | 1.2                                                                             | 1.0  | 1.2  | 1.4   | 1.7   | 1.2   | 1.3                | 21.4  | 21.2  | 1.5   |
| Livestock <sup>1</sup> ..... | 10.2                                                                            | 10.1 | 10.3 | 10.7  | 12.0  | 6.7   | 10.0               | 21.6  | 3.3   | -     |
|                              | :                                                                               | :    | :    | :     | :     | :     | :                  | :     | :     | :     |

<sup>1</sup> 1,000 head.<sup>2</sup> Cattle only.

Compiled from the Anuário Estatístico de Angola, 1938, the International Yearbook of Agricultural Statistics, 1937-38, and statistics of the U. S. Tariff Commission.

TABLE 3.—Export and import trade of Angola with principal countries, 1934-38  
(In thousands of dollars)<sup>1</sup>

| COUNTRY                   | EXPORTS |        |        |        |        | IMPORTS |        |       |        |        |
|---------------------------|---------|--------|--------|--------|--------|---------|--------|-------|--------|--------|
|                           | 1934    | 1935   | 1936   | 1937   | 1938   | 1934    | 1935   | 1936  | 1937   | 1938   |
| Portugal .....            | 6,185   | 4,983  | 6,113  | 8,684  | 6,535  | 4,247   | 3,583  | 3,044 | 4,448  | 4,436  |
| Portuguese colonies ..... | 143     | 163    | 153    | 250    | 218    | 64      | 211    | 131   | 33     | 29     |
| Germany .....             | 415     | 213    | 237    | 221    | 1,808  | 608     | 507    | 427   | 746    | 893    |
| Belgium .....             | 5,531   | 5,720  | 7,448  | 11,260 | 9,646  | 579     | 688    | 763   | 1,505  | 1,884  |
| Belgian Congo .....       | 640     | 704    | 943    | 1,676  | 2,114  | 1,975   | 2,486  | 2,156 | 6,901  | 4,980  |
| United States .....       | 197     | 178    | 309    | 190    | 180    | 584     | 544    | 529   | 831    | 1,043  |
| England .....             | 132     | 124    | 557    | 335    | 391    | 878     | 974    | 1,017 | 1,296  | 1,474  |
| Other .....               | 312     | 725    | 842    | 800    | 732    | 1,164   | 1,278  | 1,296 | 1,883  | 2,166  |
| Total .....               | 13,555  | 12,810 | 16,602 | 23,416 | 21,624 | 10,099  | 10,271 | 9,363 | 17,643 | 16,905 |
|                           | :       | :      | :      | :      | :      | :       | :      | :     | :      | :      |

<sup>1</sup> Converted from Angolares at the rate of 4.6089 cents for 1934; 4.4575 cents for 1935; 4.5130 cents for 1936; 4.4792 cents for 1937; 4.4267 cents for 1938.

Anuário Estatístico de Angola, 1938.

total, and was followed by Portugal with 30.2 percent, Belgian Congo 9.8, and Germany 8.4 percent. The United States accounted for less than 1 percent. The principal agricultural products exported were corn, sugar, coffee, coconuts, palm kernels, beans, sisal, castor-beans, palm oil, and cotton (see table 2).

Of these exports, Portugal took approximately 46 percent of the corn, almost all the sugar, 67 percent of the coffee, 87 percent of the coconuts, 12 percent of the sisal, 38 percent of the castor-beans, 80 percent of the palm oil, all the cotton, and wheat, and 94 percent of the wax. The United States imported 11.4 percent of the coffee (7, p. 30). All the livestock exported went to Portugal.

### Imports

Total imports during 1938 amounted in value to \$16,905,000, of which Portugal supplied 26.2 percent, Belgian Congo 29.5, Belgium 11.1, England 8.7, United States 6.2, and Germany 5.3 percent. The principal imports were textiles, consisting mainly of sackcloth and cotton cloth (5,648 short tons); alcoholic beverages (1,743,522 gallons); food products, consisting chiefly of wheat flour (3,520 short tons); olive oil



(136,586 gallons); codfish (347 short tons); butter and butter substitutes (33 short tons); and rice (76 short tons); gasoline (1,849,190 gallons); coal (28,660 short tons); petroleum and mineral oils (3,953 short tons); agricultural and industrial machines and their parts (1,987 short tons); metals (4,478 short tons); and trucks, automobiles, and other vehicles of transportation (1,364 short tons).

Of the goods imported, Portugal supplied almost all the alcoholic beverages, 99.4 percent of the olive oil, 63.1 percent of the agricultural tools and machinery, 45.1 percent of the cotton cloth, and 13.8 percent of the industrial machinery. The United States accounted for 94 percent of the trucks, 60.4 percent of the gasoline, 40.6 percent of the petroleum and mineral oils, and 6.9 percent of the industrial machinery (7, pp. 29-30).

#### LITERATURE CITED

- (1) FAULKNER, O. T., and MACKIE, J. R.  
1933. WEST AFRICAN AGRICULTURE. 168 pp., illus. Cambridge.
- (2) FITZGERALD, WALTER.  
1935. AFRICA. 462 pp., illus. New York.
- (3) [GREAT BRITAIN] DEPARTMENT OF OVERSEAS TRADE.  
1925. REPORT ON THE ECONOMIC SITUATION IN ANGOLA. June 1925, 37 pp. London.
- (4) \_\_\_\_\_  
1934. ECONOMIC CONDITIONS IN ANGOLA. March 1934, 53 pp. London.
- (5) \_\_\_\_\_  
1937. REPORT ON ECONOMIC AND COMMERCIAL CONDITIONS IN ANGOLA. February 1937, 43 pp. London.
- (6) HAILEY, LORD [MALCOLM].  
1938. AN AFRICAN SURVEY. 1837 pp., illus. London, New York. [etc.]
- (7) [PORTUGAL] INSTITUTO NACIONAL DE ESTATÍSTICA.  
1939. COMÉRCIO EXTERNO. Bol. do Inst. Nac. de Estatís. No. 8, 55 pp.
- (8) SHANTZ, H. L., and MARBUT, C. F.  
1923. VEGETATION AND SOILS OF AFRICA. Amer. Geog. Soc. Res. Ser. No. 13, 263 pp., illus.
- (9) WHITTLESEY, D. S.  
1924. GEOGRAPHIC PROVINCES OF ANGOLA. Geog. Rev. 14: 113-126, illus.

By Karen J. Friedmann\*

*In the contribution of Norway to the European food balance, fish and fish products are more important than the products of the farm. Norwegian fisheries supply not only fresh and salt fish, but also oils for food and industrial uses and liver oils for vitamins and medicinal uses. This study presents the statistics of Norwegian production and trade in fish and fish products for the pre-war period 1933 through 1938.*

In any evaluation of Norwegian food supplies, actual or potential, fish is a factor of great importance. Basically, Norway is also an important exporter of fish and fish products and contributes significantly to European food supplies in general. For studies of the European food balance in time of war and thereafter it is therefore desirable to have a systematic compilation of available pre-war data on the total catch and disposition of fish in Norway.

There are extensive official Norwegian statistics, dealing with various aspects of the fisheries - catch, manufacture of fish products, exports, equipment of the fishing fleet, etc., but a complete "fish balance," indicating total catch and its utilization in industry, for export, and home consumption is not readily available. An attempt has been made in this study to bring data together in such a way as to make it possible to construct such a balance. A pre-war period of 6 years, 1933 to 1938, has been chosen for this purpose.

An annual publication by the Norwegian Directorate of Fisheries, *Norges Fiskerier*, is the main source of statistical information regarding Norwegian fishing. In respect to industrial utilization of fish it is, however, not complete, and the statistics of industrial production have to some extent been used to supplement these data. Similarly, the import and export statistics have been resorted to in order to arrive at a complete picture of the supply of fish available for domestic consumption. The applicable official statistics deal only with salt-water fishing. It is true that the catch of fresh-water fish is entirely negligible when compared to total Norwegian fishing, but in estimating the amount of fish available for home consumption it is worth including.

Herring and cod are the two important items in Norwegian fishing. The herring catch in particular is subject to great variations from year to year, but on an average for the period under consideration, the two groups have accounted for approximately 85 percent of the total catch. It should be noted that the figures for fish of the cod type always refer to the weight of the fish after removal of head and entrails. This also accounts for the fact that liver and roe are included in other items.

The method by which the "fish balance" is established and total domestic consumption determined is evident from table 1. To total catch as given by official statistics have been added the catch for consumption by fishermen and their families (not included in the official data on catch, but given in a separate table in *Norges Fiskerier*) as well as the raw-fish equivalent of imported fish and an estimated amount of fresh-water fish. The latter figure is taken from the work by S. Schmidt-Nielsen (see p. 120) and is based on statements by Norwegian fishing authorities to

\* Office of Foreign Agricultural Relations.

the effect that the average catch per square kilometer of the Norwegian fresh-water area is about 200 kilograms annually.

From the sum total of these figures the following items have been deducted: The raw-fish equivalent of total exports of fish and the amount of raw fish used in the meal- and oil-producing industry. The official Norwegian statistics of industrial production are the basis of the information in respect to the production of herring meal and oil and the herring used in this production. These statistics are probably not complete, since they give only production by the factories that have had a minimum of 3,000 man-hours in each particular year. However, they do account for a large percentage of the total herring catch, so that the quantities left out could not be large. In respect to other fish and liver oils, the production statistics are very incomplete. The statistical compilations in the following tables have, therefore, been confined to codliver oil, for which the data are derived from statistics assembled and published (in *Norges Fiskerier*) by the Norwegian Directorate of Fisheries. It will be noted that the exports of medicinal liver oils exceed the production and imports of codliver oils. The difference is probably accounted for by shark, halibut, and other liver oils, but it is not possible on the basis of available statistics to account completely for these products.

The production of herring meal and oil corresponds, as will be seen, to only about 23 percent of the total weight of the herring used in this production. The statistics indicate, however, that there are some further products, such as glue, fish bonemeal, etc., but specific amounts are not given. The remaining difference in weight is accounted for by the high water content of the fish raw material.

The final result, after these items have been deducted from the total supply, the "indicated domestic consumption," amounting to an average of about 110,000 metric tons in 1933-38, is the raw-fish equivalent of indicated total home consumption of fresh, dried, salted, and canned fish. It is obviously a minimum figure. Statistics regarding fishing along the shores purely for home consumption are incomplete, according to the Directorate of Fisheries, and this type of fishing no doubt ordinarily supplies the Norwegian population with a considerable part of its domestically consumed fresh fish.

The figures for each individual year should be taken *cum grano salis*. Attention might be drawn to the year 1934, for which the herring catch is conspicuously low. A closer scrutiny of the data reveals a utilization for exports and industry that exceeds the recorded catch by some 10,000 tons. Since, however, well over half the herring exported was in the form of salted or canned products, the raw material for this may to some extent have originated in the catch of the preceding year. Similarly, a part of the salted and canned herring of earlier years may have been consumed by the Norwegian population in 1934. It is also conceivable that the winter herring catch, which sometimes continues from November until February, might have been concentrated more after the turn of the year than in other seasons. But shortcomings of the statistics are perhaps mainly responsible for such discrepancies. On the basis of these computations, average pre-war per capita consumption of fish in Norway works out at a minimum of 38 kilograms per annum. Consumption varied a great deal as among consumer groups. Detailed studies of the food consumption of a small number of families in a fishing district have disclosed an annual fish consumption as high as 96 kilograms per capita.





TABLE 2.—Norway's catch of salt-water fish, 1933-38<sup>1</sup>

| ITEM                              | FISH CATCH                   |                              |                              |                              |                              |                              |                              |
|-----------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                                   | 1933                         | 1934                         | 1935                         | 1936                         | 1937                         | 1938                         | AVERAGE<br>1933-38           |
|                                   | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> |
| Herring and brisling ....         | 754,501:                     | 377,643:                     | 632,753:                     | 708,636:                     | 529,541:                     | 707,157:                     | 618,372                      |
| Cod .....                         | 166,585:                     | 170,736:                     | 154,860:                     | 172,726:                     | 210,760:                     | 218,099:                     | 182,294                      |
| Other fish, liver, roe, etc. .... | 133,938:                     | 134,914:                     | 136,235:                     | 149,574:                     | 163,345:                     | 139,424:                     | 142,905                      |
| Total .....                       | 1,055,024:                   | 683,293:                     | 923,848:                     | 1,030,936:                   | 903,646:                     | 1,064,680:                   | 943,571                      |

<sup>1</sup> These figures do not include the fish caught for consumption by the fishermen and their families.

For source material and conversion factors used, see page 120.

TABLE 3.—Norway's exports of fish (raw-fish equivalents)<sup>1</sup>

| ITEM                                     | EXPORTS                      |                              |                              |                              |                              |                              |                              |
|------------------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                                          | 1933                         | 1934                         | 1935                         | 1936                         | 1937                         | 1938                         | AVERAGE<br>1933-38           |
|                                          | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> |
| Fresh herring .....                      | 110,651:                     | 63,359:                      | 98,440:                      | 102,430:                     | 96,294:                      | 96,116:                      | 94,548                       |
| Other fresh fish .....                   | 26,268:                      | 24,921:                      | 24,097:                      | 26,639:                      | 28,275:                      | 23,769:                      | 25,662                       |
| Dried fish .....                         | 105,936:                     | 91,044:                      | 88,168:                      | 79,260:                      | 135,128:                     | 104,008:                     | 100,591                      |
| Salted, rock-dried cod (klippfisk) ..... | 88,133:                      | 97,305:                      | 94,557:                      | 97,343:                      | 104,277:                     | 111,883:                     | 98,916                       |
| Salt herring .....                       | 74,683:                      | 51,305:                      | 42,841:                      | 66,188:                      | 60,368:                      | 41,981:                      | 56,228                       |
| Other salt fish .....                    | 8,002:                       | 9,814:                       | 8,004:                       | 4,459:                       | 14,525:                      | 10,008:                      | 9,135                        |
| Canned fish .....                        | 36,146:                      | 33,773:                      | 41,656:                      | 45,377:                      | 43,523:                      | 31,703:                      | 38,696                       |
| Total fish .....                         | 449,819:                     | 371,521:                     | 397,763:                     | 421,696:                     | 482,390:                     | 419,468:                     | 423,776                      |
| Roe .....                                | 8,570:                       | 7,869:                       | 7,410:                       | 5,206:                       | 5,834:                       | 5,245:                       | 6,689                        |
| Total .....                              | 458,389:                     | 379,390:                     | 405,173:                     | 426,902:                     | 488,224:                     | 424,713:                     | 430,465                      |

<sup>1</sup> For conversion of the exported quantities of dried, salted, and canned fish into raw-fish equivalent the following coefficients have been used: 1 kg. dried fish (cod) = 4 kg. fresh fish. 1 kg. salted, rock-dried cod = 2.7 kg. fresh fish. 1 kg. salt herring = 1.25 kg. fresh herring. 1 kg. other salt fish = 1.7 kg. fresh fish. 1 kg. canned fish (herring) = 1.2 kg. fresh fish. These conversion factors have been used by S. Schmidt-Nielsen in: Vårt Matforbruk 1938 og litt om vår Matberging Idag. Trondheim 1940, p. 38-40. They correspond quite closely to the factors that appear to have been used in other Norwegian reports dealing with fishing.

For source material and other conversion factors used, see page 120.

TABLE 4.—Norway's utilization of fish for the production of oil and meal, and for canning

| ITEM                                | UTILIZATION OF FISH          |                              |                              |                              |                              |                              |                              |
|-------------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                                     | 1933                         | 1934                         | 1935                         | 1936                         | 1937                         | 1938                         | AVERAGE<br>1933-38           |
|                                     | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> | <i>Metric</i><br><i>tons</i> |
| For the production of oil and meal: |                              |                              |                              |                              |                              |                              |                              |
| Herring and brisling (fish) .....   | 485,500:                     | 249,100:                     | 419,800:                     | 421,200:                     | 269,700:                     | 449,900:                     | 382,533                      |
| Herring and brisling (offals) ..... | 10,600:                      | 11,800:                      | 16,200:                      | 14,600:                      | 14,800:                      | 13,500:                      | 13,583                       |
| Other fish (offals) ..              | 16,760:                      | 21,830:                      | 25,432:                      | 19,984:                      | 18,148:                      | 16,536:                      | 19,782                       |
| Fish and offals ....                | 512,860:                     | 282,730:                     | 461,432:                     | 455,784:                     | 302,648:                     | 479,936:                     | 415,898                      |
| Cod liver .....                     | 15,878:                      | 16,112:                      | 13,678:                      | 13,765:                      | 15,756:                      | 14,493:                      | 14,947                       |
| Total .....                         | 528,738:                     | 298,842:                     | 475,110:                     | 469,549:                     | 318,404:                     | 494,429:                     | 430,845                      |
| For canning:                        |                              |                              |                              |                              |                              |                              |                              |
| Herring and brisling ..             | 38,405:                      | 27,545:                      | 45,146:                      | 48,303:                      | 45,793:                      | 43,952:                      | 41,524                       |
| Other fish .....                    | 4,064:                       | 4,821:                       | 5,651:                       | 6,374:                       | 6,188:                       | 4,327:                       | 5,238                        |
| Roe .....                           | 395:                         | 255:                         | 450:                         | 651:                         | 574:                         | 557:                         | 480                          |

For source material and conversion factors used, see page 120.

TABLE 5.—Norway's production and trade in fish oil and meal, and codliver oil, 1933-38

| ITEM                                    | QUANTITY       |                |                |                |                |                |                    |
|-----------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|
|                                         | 1933           | 1934           | 1935           | 1936           | 1937           | 1938           | AVERAGE<br>1933-38 |
|                                         | Metric<br>tons | Metric<br>tons | Metric<br>tons | Metric<br>tons | Metric<br>tons | Metric<br>tons | Metric<br>tons     |
| Production and trade:                   |                |                |                |                |                |                |                    |
| Production:                             |                |                |                |                |                |                |                    |
| Herring oil <sup>1</sup> .....          | 22,125         | 8,283          | 24,504         | 27,337         | 12,643         | 26,255         | 20,191             |
| Codliver oil .....                      | 7,261          | 7,857          | 6,409          | 5,916          | 7,141          | 6,454          | 6,840              |
| Herring meal .....                      | 86,147         | 44,431         | 76,517         | 77,874         | 51,616         | 88,322         | 70,818             |
| Other fish meal .....                   | 13,859         | 18,434         | 12,652         | 13,494         | 15,236         | 15,438         | 14,857             |
| Export:                                 |                |                |                |                |                |                |                    |
| Herring oil .....                       | 7,038          | 3,204          | 7,200          | 13,444         | 5,725          | 9,328          | 7,656              |
| Medicinal liver oil <sup>2</sup> ....   | 12,077         | 12,778         | 10,830         | 11,458         | 11,592         | 9,310          | 11,341             |
| Herring meal .....                      | 70,952         | 40,536         | 55,055         | 56,672         | 33,769         | 67,869         | 54,142             |
| Other fish meal .....                   | 14,451         | 22,228         | 9,178          | 17,247         | 9,955          | 12,209         | 14,211             |
| Import:                                 |                |                |                |                |                |                |                    |
| Herring oil .....                       | 4,746          | 1,229          | 9,558          | 13,504         | 20,003         | 9,829          | 9,812              |
| Medicinal codliver oil :                | 1,584          | 858            | 790            | 417            | 353            | 182            | 697                |
| Herring and other fish<br>meal .....    | 1,623          | 8,289          | 2,903          | 1,760          | 10,926         | 6,691          | 5,365              |
| Balances by products:                   |                |                |                |                |                |                |                    |
| Herring oil:                            |                |                |                |                |                |                |                    |
| Production .....                        | 22,125         | 8,283          | 24,504         | 27,337         | 12,643         | 26,255         | 20,191             |
| Imports .....                           | 4,746          | 1,229          | 9,558          | 13,504         | 20,003         | 9,829          | 9,812              |
| Exports .....                           | 7,038          | 3,204          | 7,200          | 13,444         | 5,725          | 9,328          | 7,656              |
| Net trade .....                         | -2,292         | -1,975         | +2,358         | +60            | +14,278        | +501           | +2,156             |
| Indicated domestic<br>utilization ..... | 19,833         | 6,308          | 26,862         | 27,397         | 26,921         | 26,756         | 22,347             |
| Herring and other fish<br>meals:        |                |                |                |                |                |                |                    |
| Production .....                        | 100,006        | 62,865         | 89,169         | 91,368         | 66,852         | 103,760        | 85,670             |
| Imports .....                           | 1,623          | 8,289          | 2,903          | 1,760          | 10,926         | 6,691          | 5,365              |
| Exports .....                           | 85,403         | 62,764         | 64,233         | 73,919         | 43,724         | 80,078         | 68,353             |
| Net trade .....                         | -83,780        | -54,475        | -61,330        | -72,159        | -32,798        | -73,387        | -62,988            |
| Indicated domestic<br>utilization ..... | 16,226         | 8,390          | 27,839         | 19,209         | 34,054         | 30,373         | 22,682             |
| Liver oils:                             |                |                |                |                |                |                |                    |
| Codliver-oil production:                | 7,261          | 7,857          | 6,409          | 5,916          | 7,141          | 6,454          | 6,840              |
| Medicinal liver oils,                   |                |                |                |                |                |                |                    |
| imports .....                           | 1,584          | 858            | 790            | 417            | 353            | 182            | 697                |
| exports .....                           | 12,077         | 12,778         | 10,830         | 11,458         | 11,592         | 9,310          | 11,341             |

<sup>1</sup> Not entirely complete. Only production by factories operating 3,000 man-hours in each particular year is included. <sup>2</sup> The excess export of medicinal liver oils over production plus imports of codliver oil is probably accounted for by shark- halibut- and other liver oils.

### Source Material and Conversion Factors

The following source material was used in the compilation of tables 1 to 5: (1) *Norges Fiskerier* 1933-38, Norges Offisielle Statistikk IX 68, IX 88, IX 108, IX 139, IX 172, IX 195; (2) *Norges Industri*, produksjonsstatistikk 1933-38, Norges Offisielle Statistikk IX 44, IX 75, IX 105, IX 131, IX 157, IX 188; (3) *Norges Handel*, 1933-38, Norges Offisielle Statistikk IX 35, IX 58, IX 86, IX 114, IX 138, IX 173; (4) Det Statistiske Sentralbyrå, *Statistisk Årbok for Norge* 1940; (5) S. Schmidt-Nielsen, *Vårt Matforbruk i 1938 Og Litt Om vår Matberging Idag*, Trondheim 1940.

For the computations in tables 1 to 5 all weights and measures have been converted into metric tons, on the basis of the following equivalents: 1 hectoliter herring or liver = 1 tønne = 100 kg. 1 skjepp herring = 17.39 liter = 17.39 kg. 1 mål herring = 136 kg. 1 hl. fish or herring oil = 93 kg. 1 cod-type fish ("skrei"), after removal of head and entrails = 2.7 to 4 kg.; namely, 3.4 kg. for cod from Møre and Romsdal Counties and counties south of there, 3.7 kg. if from Trøndelagen, 4 kg. if from Nordland, and 2.7 kg. if from Troms and Finnmark.

These conversion factors have all been derived from official Norwegian statistics. One metric ton equals 2204.6 pounds or 1.1023 short tons.